

## REMARKS

### SUMMARY

The examiner rejected claims 6-7 under 35 USC 112 second paragraph for insufficient antecedent basis and claims 1-9, 15, and 21 for the use of "whereby".

Claims 1, 3, 6-7 and 9 were rejected under 35 USC 102(e) as being anticipated by Goswami (US 5,835,840). Claims 1-14 were rejected under 35 USC 102(e) as being anticipated by Yamanaka et al. (US 5,919,422). Claims 2, 10-11, and 13-14 were rejected under 35 USC 103(a) as being unpatentable over Goswami. Claims 15 and 21 were rejected under 35 USC 103(a) as being unpatentable over Yamanaka et al. Claims 2 and 10 were rejected under 35 USC 103(a) as being unpatentable over Goswami in further view of Dimitrik (US 3,844,741).

The applicant amends claims 1-2, 6-7, 10, 15, and 21. All other claims remain unamended.

### APPLICANT'S REASONS FOR AMENDING

The applicant amends claim 1 to change "heater" to "heater means for drawing air into said reactor and causing said air to rise". Means plus function claiming is allowed under 35 USC 112

paragraph 6. This amendment does NOT narrow the original claim.

The applicant amends claim 2 to change "a pair of electrical prongs protruding from said device, whereby said device can be directly plugged into an electrical outlet" to "a pair of electrical prongs protruding from said device, said electrical prongs allowing said device to be directly plugged into an electrical outlet". This amendment does NOT narrow claim 2 since it is claiming exactly the same scope. "A whereby clause is proper when it merely describes a function that necessarily follows from the previously recited structure." "Therefore equate 'whereby' with 'it follows from the foregoing that ...'." Robert C. Farber, Landis on Mechanics of Patent Claim Drafting, Sec 32 (3rd ed. 1990).

The applicant amends claims 6 and 7 to replace "chimney" with "reactor" to achieve antecedent basis. This amendment does NOT narrow the claim since reactor is broader than chimney (a chimney is a specie of reactor).

The applicant amends claim 10 as claim 1 changing "heater" to "heater means" exactly as in claim 1. Again this does NOT narrow claim 10 (see arguments for claim 1 above).

The applicant amends claim 15 by changing "an opening for allowing the visible light to escape" to "a means for allowing

the visible light to escape". Changing from a specified structure to a means plus function for broadens the claim. In addition, the whereby clause of claim 15 has been deleted. This either broadens the claim or leaves the scope unchanged.

The applicant amends claim 21 by changing "heater" to "heater means" exactly as in claims 1 and 10. This change does NOT narrow the claim (see arguments for claim 1 above). In addition the phrase "said device also becoming a night light" is dropped. Dropping this phrase broadens the claim.

#### ARGUMENTS FOR ALLOWANCE

##### Claim 1

Claim 1 was rejected under 35 USC 112 for the use of "whereby". That has been removed. Claim 1 was rejected under 35 USC 102(e) as being anticipated by Goswami and also by Yamanaka et al. Neither Goswami or Yamanaka teach a heater means for causing air to rise by convection. Since means plus function claiming is permitted by 35 USC 112 paragraph 6, this claim, as amended, is not anticipated by the cited art.

The examiner argues that the manner by which an apparatus is operated is insufficient to cause it to be patentably distinct over the prior art. The applicant will not discuss the truth or

falsity of this statement; however, the convection feature of the applicant's invention is not the way it is operated, but rather a functional element and limitation that is now claimed in means plus function language. "An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, .....". 35 USC 112 paragraph 6. A heater means for drawing in air and causing it to convect upward is a means for performing a function.

#### Claim 2

Claim 2 was rejected as being anticipated by Yamanaka et al. and as being unpatentable over Goswami. Since Yamanaka does not mention anything about electrical prongs, it cannot anticipate the claim. As to obviousness, the examiner states that Groswami is silent with respect to a pair of electrical prongs protruding from the device (Examiner action, page 5, 2nd paragraph). The examiner argues that protruding electrical prongs are functionally equivalent to electrical leads. However, this reasoning is erroneous because protruding electrical prongs allowing the device to be directly plugged into an outlet realize an additional benefit of having the outlet support the device as is shown in the applicant's figure 3. Electrical leads cannot do this. Therefore, it is not possible to make out a prima facie case of obviousness for claim 2 from Groswami.

Claim 2 was also rejected as being unpatentable over Goswami in further view of Dimitrik. The examiner argues that Dimitrik teaches an air purifier (of the old filter type) with an electrical plug (a standard wall plug). Dimitrik states: "A plug 56 may be connected to any suitable power source .... " [Dimitrik col 3, line 13]. This hardly suggests prongs protruding from the device to plug the device directly into a wall outlet (with the outlet thereby supporting the device). The applicant concedes that thousands of devices, among them air purifiers, can be found with plugs on the end of cords like Dimitrik. This reference when combined with Goswami does not remotely suggest the applicant's invention.

### Claim 3

Claim 3 narrows claim 1 to specify a particular photocatalyst. Claim 3 must be read with all the limitations of its parent claim (claim 1) which is allowable (see argument above concerning claim 1). If Goswami does not anticipate claim 1 it cannot anticipate claim 3. The same applies for Yamanaka.

### Claim 4 and claim 5

Claim 4 depends on and narrows claim 3 to a photocatalyst titanium dioxide doped with a dopant while claim 5 further narrows claim 4 by naming the dopant as platinum. Claim 3-5 are

rejected as being anticipated by Yamanaka. However, since the applicant argues that claim 1, the parent claim, is allowable, it is impossible for the dependent claims to then be anticipated.

Yamanaka does teach the use of dopants in titanium dioxide including platinum. It is well known in the art to dope titanium dioxide with platinum and other dopants to increase photocatalytic activity. However, such mention does not clause Yamanaka to anticipate the applicant's invention of a reactor using a heater means to cause air to rise past the possibly doped photocatalyst by convection simply because Yamanaka does not teach convection.

#### Claim 6-9

Claim 6 narrows claim 1 by adding a means for controlling humidity. Claim 6-7 were rejected as being anticipated by both Goswami and Yamanaka. Claim 8 was rejected as being anticipated by Yamanaka. Claim 9 was rejected as being both anticipated by Yamanaka and Goswami. Claims 7 and 8 narrow claim 1 by adding a fibrous mass that may be fiber glass. Claim 9 narrows claim 1 by supplying a range of wavelengths for the light source. Since by previous argument, the base claim is allowable (because of convection), the dependent claims are allowable since they act to narrow the base claim and cannot be thus anticipated.

Also Yamanaka teaches glass cloth which is different from a

fibrous mass of fiber glass (cloth is a woven system) [Yamanaka Col 26, lines 46-49].

Claims 10-14

Claim 10 was rejected as anticipated by Yamanaka, and in addition claims 10-11, 13-14 are rejected as being unpatentable over Goswami. As to the anticipation, the same arguments apply that were made for claims 1-9.

The argument concerning electrical leads vs protruding prongs has been made with respect to claim 2: it would not be obvious to one of ordinary skill in the art to substitute the electrical leads of Goswami or the plug of Dimitrik for the protruding prongs of the applicant since the applicant's protruding prongs allow the device to be directly plugged into an outlet. This act causes the outlet to physically support the device. This is a result that cannot be foreseen from electrical leads or plugs alone.

Claim 10 was also rejected as being unpatentable over Goswami in further view of Dimitrik. The applicant has already argued this in reference to claim 2. Dimitrik adds no suggestion to combine or to use protruding prongs plugged directly into an outlet.

As to claims 13-14, Goswami teaches both ultraviolet light and visible light in the range 300 to 400 nm. while Yamanaka teaches 360-400 nm. The applicant does not dispute the fact that this ranges contains a visible component. However, nothing in Goswami or Yamanaka suggests combining such light with a reactor that moves air past a photocatalyst by convection. Yamanaka teaches many applications of photocatalysts, but not of a reactor where air moves through it without fans. Goswami teaches only the use of fans to control airflow.

#### Claims 15 and 21

Claims 15 and 21 were rejected as being unpatentable over Yamanaka. As the examiner states, Yamanaka is silent with respect to an opening that allows visible light to escape. Yamanaka does not suggest using any of his devices as lights as well as air purifiers, except that in one case Yamanaka suggests that if the LED emits visible light as well as UV, a user can tell that it is in operation, and the LED can produce an illuminating or displaying effect [Yamanaka col. 16, line 44-47].

However, claims 15 and 21 must be taken as a whole. In order to reject claim 15 on a single reference, it must suggest to one of ordinary skill in the art all the limitations of claim 15, 14, 13, 11, and 10 (chain of dependence). To reject claim 21 on a single reference, it must suggest to one of ordinary skill



in the art all the limitations of claim 21. The applicant argues that there is no suggestion in Yamanaka to use a heater means to cause air to rise past a photocatalyst and allow a visible component generated by an ultraviolet light source to be used as light in addition to an air purifying device.

### Conclusion

In view of the foregoing, and upon further review of the matter, the Examiner will reach the conclusion that the claims now pending are distinguishable over the cited art. For that reason, it is respectfully requested that the examiner reconsider the application for allowance at as early a date as possible.

Respectfully submitted

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MARKED UP VERSIONS OF THE AMENDED CLAIMS

1. (amended) A device for purifying air comprising:  
a reactor;  
a photocatalyst located in said reactor;  
an ultraviolet light source located in said reactor, said ultraviolet source illuminating said photocatalyst;  
a heater means located in said reactor[, whereby air is drawn] for drawing air into said reactor by convection[, ] and causing said air [rising] to rise past said photocatalyst before being expelled.
2. (amended) The device for purifying air of claim 1 further comprising[:] a pair of electrical prongs protruding from said device, [whereby] said electrical prongs allowing said device [can] to be directly plugged into an electrical outlet.
6. (amended) The device for purifying air of claim 1 further comprising a means for controlling humidity in said [chimney] reactor.
7. (amended) The device for purifying air of claim 1 further comprising a fibrous mass located in said [chimney] reactor, said fibrous mass holding said photocatalyst.
10. (amended) A compact device with a base and a top for purifying air that is plugged directly into a wall power outlet comprising a set of power prongs protruding from the device for plugging into the wall outlet, a compartment containing a photocatalyst that is illuminated by an ultraviolet light source, and opening at the base of the device for air to enter, a heater means in the device near this opening [that heats] for heating air entering the device and causing this air to rise past the illuminated photocatalyst, the air becoming purified, and an exit port at the top of the device for the purified air to exit.
15. (amended) The compact device of claim 14 further comprising [an opening that allows] a means for allowing the visible light to escape[, whereby the device acts as a night light while purifying air].
21. (amended) A device for purifying air comprising:  
a chimney with a base and top;

a photocatalyst located in said chimney;

an ultraviolet light source located in said chimney, said ultraviolet source illuminating said photocatalyst with ultraviolet light of wavelength shorter than 387 nanometers, said ultraviolet light source also producing visible light;

a heater means located at the base of said chimney[, whereby air is drawn] for drawing air into said chimney by convection[, said air rising] and causing said air to rise past said photocatalyst, said air being expelled from the top of said chimney;

a means for allowing said visible light to escape from said chimney[, said device also becoming a night light].